

NON-PUBLIC?: N  
ACCESSION #: 8705080218  
LICENSEE EVENT REPORT (LER)

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FACILITY NAME: Pilgrim Nuclear Power Station - Unit No. 1

DOCKET NUMBER: 05000293

TITLE: Loss of Preferred Off-Site Power During A Storm  
EVENT DATE: 03/31/87 LER #: 87-005-00 REPORT DATE: 04/29/87

OPERATING MODE: N POWER LEVEL: 000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR  
SECTION  
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:  
NAME: Brian P. Lunn, Senior Plant Engineer TELEPHONE #: 617-747-8241

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: At approximately 0845 hrs on Tuesday, March 31, 1987, a loss of the preferred off-site power occurred during a storm. The Pilgrim Nuclear Power Station (PNPS) was in the cold condition/refueling mode with the reactor vessel defueled. Initiating the event was the loss of a transmission line (#342) feeding the Pilgrim Station. The alternate transmission line (#355) became isolated from the strat-up transformer for two reasons; a switchyard air circuit breaker (ACB) being out of service for maintenance and the automatic switching performed to isolate line #342 from the PNPS 345 KV ring bus. The 23KV system was unaffected by the loss of off-site power and remained in service. Plant safety systems responded correctly for the existing plant configuration including Engineered Safety Feature (ESF) actuations, except for 480VAC emergency bus (B-6) which failed to re-energize.

Initial corrective action was to restore off-site power to the 345 KV start-up transformer from the alternate transmission line (#355) by closing ACBs 103 and 104 after opening disconnect T900 (see attachment 1). Investigation revealed that breaker maintenance in progress prevented the B-6 emergency bus from re-energizing due to defeat of an interlocking circuit. Emergency bus B-6 was manually re-energized following restoration of off-site power.

This event had no impact on the safety of the reactor, or its associated systems, or public health and safety.

(End of Abstract)

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At approximately 0845 hrs. on Tuesday, March 31, 1987, a loss of preferred off-site power occurred during a storm. The 23KV system was unaffected by the loss of off-site power and remained in service. The Pilgrim Nuclear Power Station (PNPS) was in the cold condition/refueling mode at that time with the reactor vessel defueled. The following events occurred from this loss of off-site power.

Primary Event:

Off-site power was being supplied to the PNPS start-up transformer (EIIS Code EA) through two separate 345KV lines #342 and #355 (see attached sketch, PNPS 345 KV transmission system). Line #342 faulted during the storm when a static line broke and fell onto the conductors at the Jordan Road Tap in Plymouth several miles from the station. Sensing the ground occurrence in line #342, Air Circuit Breakers (ACB's) 103 and 104 both opened in the 345 KV switchyard (EIIS Code FK). This action is in accordance with its design. Power to the PNPS start-up transformer would normally have been supplied without interruption, from the alternate line (#355), through the normally closed ACB 102. However, on March 27, 1987, ACB 102 was opened and removed from service for routine maintenance, remaining unavailable during the storm. When preferred off-site power was lost, the 'A' emergency diesel generator (EIIS Code EK) automatically started and supplied power to its emergency bus. The 'B' emergency diesel generator had previously been removed from service for planned maintenance.

Cause:

This event was caused by the fallen static wire on line #342. The static wire apparently fell due to the high winds and rain.

Corrective Action:

Restoration of power to PNPS commenced by opening the terminal disconnects (T900) isolating line 342 from the 345 KV ring bus (see attached sketch). ACBs 103 and 104 were then closed restoring power to the PNPS start-up transformer from line #355 via the 345 KV ring bus. The 'A' emergency diesel generator was removed from service upon restoration of power to the start-up transformer. Line #342 was repaired and reconnected to the station switchyard in early evening.

Restoration of off-site power was accomplished at approximately 0930

hours. The 'A' emergency diesel generator was removed from service upon restoration of power to start-up transformer.

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#### Secondary Event:

As previously discussed, the 'A' emergency diesel generator automatically started and supplied power to its emergency bus. Engineered safety systems responded as expected for the existing plant conditions except emergency 480 V bus B-6 (EHS Code EC) which failed to re-energize following restoration of power by the diesel generator. The B-6 bus can be supplied from either the A Train 480 volt bus B-1 or the Train 480 Volt bus, B-2, (EHS Code EA) (See attached sketch).

Prior to the loss of off-site power bus B-6 was being supplied from B-1. The alternate B-6 feed from bus B-2 was disconnected with breaker 52-202 removed from its cubicle for maintenance and breaker 52-602 open.

When the 345 KV power was lost, the two in service B-6 supply breakers (52-102 and 52-601) tripped open upon sensing undervoltage on the B-1 bus. Upon restoration of power to the B-1 bus via the 'A' emergency diesel generator, the 4KV bus A5, and distribution transformer, X21, breakers 52-102 and 52-601 should have automatically closed. However, breaker 52-102 remained in the open position.

When B-6 bus did not re-energize operations personnel attempted unsuccessfully to close the 52-102 breaker utilizing the control switch at the breaker cubicle. Investigation determined that the removal of tie bus breaker 52-202 from its cubicle had defeated the automatic and manual closing logic circuits for breaker 52-102. Plant Staff manually completed the interlock contact of 52-202 and restored power to the B-6 emergency bus at approximately 1027 hours.

#### Cause:

A detailed review of the logic circuitry drawings was not performed when preplanning for removal of breaker 52-202.

#### Corrective Action:

As immediate corrective action a jumper was inserted to complete the closing logic for the interlocked B-1 supply breaker (52-102). The B-6 bus was then manually restored.

A detailed evaluation of this event is included in a report dated 4/17/87

(ref. memo TCH 87-251). Boston Edison will develop permanent corrective action based on this report.

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#### Safety Assessment:

At the time of these events, the reactor was in the defueled cold condition. The failure of the B-6 bus to re-energize promptly had no adverse safety effect, with the remainder of the required safety systems responding to maintain the plant in a safe condition. Although not used, the backup off-site power supply remained available throughout this event. This event had no impact on the health and safety of the public.

#### Similar Occurrences:

A review of LER records reveals that no simultaneous loss of off-site power and a failure of B-6 bus to re-energize has been reported. However, other occurrences of a loss of preferred off-site power have been reported resulting from severe winter storms (LER 86-027, LER 82-051, LER 78-003 and LER 77-021T); insulator washing (LER 86-029, LER 85-025 and LER 83-007); lightning strikes (LER 83-045, LER 79-003 and LER 79-027); forest fire (LER 77-201P); personnel error (LER 84-017); and collapse of a 100 ft shield mast in the 345 KV yard (LER 78-002/01X-1).

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PILGRIM NUCLEAR STATION 345 KV. TRANSMISSION SYSTEM.

ONE LINE SKETCH CONDITIONS AT TIME OF EVENT

FIGURE OMITTED - NOT KEYABLE (DIAGRAM)

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EMERGENCY 480 V. BUS B-6 TRANSFER ARRANGEMENT

ONE LINE SKETCH CONDITION AT TIME OF EVENT

FIGURE OMITTED - NOT KEYABLE (DIAGRAM)

ATTACHMENT # 1 TO ANO # 8705080218 PAGE: 1 of 1

BOSTON EDISON  
Executive Offices

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Ralph G. Bird  
Senior Vice President - Nuclear

April 29, 1987  
BECO Ltr. #87-067

U.S. Nuclear Regulatory Commission  
Attn: NRC Document Control Desk  
Washington, D. C. 20555

License No. DPR-35  
Docket No. 50-293

Subject: Licensee Event Report 87-005-00

Dear Sir:

The attached Licensee Event Report 87-005-00 "Loss of Preferred Off-Site Power During A Storm" is hereby submitted in accordance with the requirements of 10CFR50.73.

Please do not hesitate to contact me directly if you have any questions.

/s/ R. G. Bird  
R. G. Bird

JF/la

Attachment

cc: Regional Administrator  
U.S. Nuclear Regulatory Commission  
631 Park Avenue - Region I  
King of Prussia, PA 19406

Director, Office of Inspection and Enforcement  
U.S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Senior Resident Inspector

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